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ABSTRACT

This study investigated the relationships among environmental noise (i.e., location, type, and constancy) and graduate student preferred learning styles (visual-overhead transparencies, auditory-lecture, kinesthetic-activity), gender, and age differences. The participants were 43 graduate students, who were currently teachers with experience ranging from 5 to 30 years. Six were male, and 36 were female; 76.7% were White, and 16.3% were African American. Participants completed a survey and indicated their demographic factors, preferred learning styles, and environmental noise variables. Data were analyzed using the Statistical Package for the Social Sciences and inferential statistical procedures. The independent variables were environmental noise (location, type, and constancy) gender, and age, and the dependent variables were preferred learning styles. Results indicate that graduate students enrolled in teacher education courses preferred auditory-visual and kinesthetic activities. There were no significant differences among noise, gender, or age and preferred learning style. Limitations and implications for future research are discussed. (Contains 11 tables and 11 references.) (Author/SLD)

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Graduate Student Learning Styles and the Environmental Factor of Noise: A Pilot Study

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Abstract

Learning styles appear to have changed from auditory preferences to visual and kinesthetic preferences over the last four decades among university students throughout the world's cultures. This may be due to increases in environmental noise.

The main purposes of this study were to investigate the relationships among environmental noise (e.g., location, type and constancy) and graduate student preferred learning styles (e.g., visual-overhead transparencies, auditory-lecture, kinesthetic-activity), gender and age differences.

The participants in this sample consisted of 43 graduate students who are currently teachers. Their teaching experiences ranged from 5 to 30 years in a southern state who were studying at a southern university. Of these teachers, 6 were male and 36 were female. 16.3% per cent were African American, 4.6% Spanish or Native American, and 76.7% White American born from original European or Australian descent and one declined to give familial descent information (2.3%). The teachers considered themselves to be drawn from large city (11), medium city (8), small town (17), and rural areas (7).

A survey instrument was given to the participants. The participants indicated their demographic factors, preferred learning styles, and environmental noise variables under separate headings.

Data were analyzed using SPSS descriptive and inferential statistical procedures. The independent variables were environmental noise (location, type,

and constancy) gender, and age. The dependent variables were preferred learning styles.

The results indicated that graduate students enrolled in teacher education courses preferred auditory-visual and kinesthetic activities. There were no significant differences among noise (constancy and type), gender, or age and preferred learning style. Limitations, and implications for future research are discussed.

Graduate Student Learning Styles and the Environmental Factor of Noise: A Pilot Study

The issue of learning style preferences has become more important in the last two decades. Students that are taught according to their learning style appear to achieve better than those who are taught with instructional strategies that do not match their preferred learning style (Salend, 1998). Learning style has been defined as " individual differences in the way information is perceived, processed, and communicated (Campbell, Campbell, & Dickinson,1999 as cited in Haar, Hall, Schoepp, Smith, 2002) and their unique way to learning material (Gadt-Johnson, 2000).

Reid's popular learning style categorization divides learning styles into six learning style types: visual, auditory, kinesthetic, tactile, group, and individual. In addition to these, Reid (1987; 1995, as cited in Peacock, 2001) generated six hypotheses.

H^1: All students have their own learning styles and learning strengths and weaknesses.

H^2: A mismatch between teaching and learning styles causes learning failure, frustration, and demotivation.

H^3 Learning styles (if unchecked) persist regardless of teaching methods and materials

H^4: Learning styles can be adapted because they are partly habit rather than biological attributes.

H^5: Learning will be improved if students become aware of a wider range of styles and stretch their own styles.

(Peacock, 2001,p. 2)

Of special interest is hypothesis 4 that assumes learning styles to be partially adapted. This assumption was corroborated by Fielding (1994), who also investigated the idea of their flexibility by using Honey and Mumford's 1968 *Learning Styles Questionnaire* (as cited in Veronica & Lawrence (1997).

Based on this assumption, if learning styles are partially adapted then changing environmental factors may cause people to change learning styles over time. Thus, a strictly visual learning style can change to a kinesthetic learning style or an auditory learning style can change to a visual learning style.

Peacock's (2001) findings suggest that Chinese students preferred kinesthetic and tactile with visual as a minor learning style. Of special interest are the suggestions that science students may prefer Group styles; humanities students may prefer auditory and individual styles, and older (2^{nd} year and above) students may have a stronger preference for kinesthetic styles. In this

may prefer auditory and individual styles, and older (2nd year and above) students may have a stronger preference for kinesthetic styles. In this study it was also suggested that the most effective learners are able to adapt to the style that the learning situation requires (Vaughn, & Baker, 2001). Ladd and Ruby (1999) investigated the learning styles of international students majoring in business at a state university. The findings from the survey and the use of the Canfield's *Learning Styles Inventory* indicated that, although the students were accustomed to lecture in their own country, they preferred direct experience while studying in the U.S. This contradicts the findings of Hussein's investigation where international graduate students in the College of Agricultural and Life Sciences and the College of Engineering preferred a listening learning style (Hussein, 1986, as cited in Ladd, (1999).

Increased mobility and technical advances in transportation have caused people to move either into noisier or less noisy areas that may have effected changes in preferred learning styles. No studies were found in which the factor of environmental noise was associated with preferred learning style. The apparent differences and adaptability among learning styles of direct experience and listening through lecture indicate that additional research in this area is required. It may be that developmental growth and environment or environmental changes at certain developmental levels may have an effect on preferred learning styles.

A number of studies have suggested that learning styles can change over the short term. However, no age factors were studied in e.g., studies done by Haddon & Lytton, (1968) and Kolb (1984) as cited in Hayes and Allinson (1997), Rush & Moore (1991).

The main purposes of this study were to investigate if living conditions with- or without different types of environmental noise from different locations influence the learning style of graduate students enrolled in a teacher education program. For purposes of this study, the independent variables that were investigated were the factors of age, gender, environmental "noise" indicating nature and traffic sounds from within and outside the home. The dependent variables were preferred learning styles.

Research Questions

The main purposes of this study were to investigate the relationships among environmental noise (e.g., location, type and constancy) and graduate students' preferred learning styles (e.g., visual-overhead transparencies, auditory-lecture, kinesthetic-activity), gender and age differences.

Four research questions were investigated in this pilot study. These questions were as follows:

1. Is there a relationship between home environmental noise type and constancy (i.e. large amount of traffic noise to rarely hearing traffic noise but nature sounds) heard from the inside of the house and preferred learning style for graduate students enrolled in a teacher preparation program?

2. Is there a relationship between home environmental noise type and constancy (i.e. large amount of traffic noise to rarely hearing traffic noise but nature sounds) heard outside of the house and preferred learning style for graduate students enrolled in a teacher preparation program?

3. Is there a relationship between gender and preferred learning styles for graduate students enrolled in a teacher preparation program?

4. Is there a relationship among age levels and preferred learning styles for graduate students enrolled in a teacher preparation program?

Method

Participants

The population for this investigation consisted of graduate students currently teaching in Kindergarten through 12th grade (K-12) in general and special education setting. These students were teachers enrolled in summer graduate courses of a teacher education program. The convenience sample drawn from this population consisted of 43 students attending four graduate special education classes. There were 6 male participants, 36 female participants and 1 declined to give gender information. Of the participants, 7 were African American-born in the United States (16.3%). 2 were Spanish-American born outside of the United states or Native American (4.6%), 33 were American White born in a family from European or Australian descent (76.7%), and one declined to give familial descent information (2.3%). Thirty-seven participants had Bachelors degrees and 6 had Masters degrees. Of the participants 6 considered themselves to live in the inner city section of a major city, 5 in the suburbs of a major city, 3 in the inner section of a medium city, 5 in the suburb of a medium city, 17 in a rural town, and 7 in rural country. The participants' age ranges were as follows: 17-27 (n=9), 28-33 (n=10), 34-45 (n= 11), and 46-63 (n=12).

Research Design and Analyses

Forty four questionnaires were distributed to four summer graduate special education classes at the southern university. This group made up the convenience sample. Findings from a convenience sample can be inferred to a population if there is agreement on one or more basic characteristics.(Gall, Gall & Borg, 2003) Forty three of these could be utilized. General demographic data was secured as part of the questionnaire (Table 1).

The questionnaires were analyzed using SPSS 7.5 descriptive and inferential modules in terms of age, gender, environmental noise constancy and type from outside and inside locations as the independent variables. The dependent variables were preferred teaching-learning styles.

General descriptive and one-way ANOVA statistical procedures were applied to analyze the data. ANOVA procedures were used to find mean differences relating age, gender, inside and outside locations noise and constancy to preferred teaching-learning style. It was hypothesized that there would be relationships among noise constancy (constant, occasional, rare) and type (traffic vs. nature sounds) at two locations (inside and outside of the home) and preferred teaching-learning style. Participants living in a noisier environment would prefer to have more actively involved teaching-learning styles.

Instruments

The validated questionnaire consisted of three major sections that were utilized for purposes of this investigation. The first section consisted of demographic data [age, gender, general living area (major city, medium city, rural town or country), familial descent, work experience, education status, and degree and/or certification area for which the participant was studying]. The second major section consisted of 10 statements indicating different teaching styles with the participant indicating their disagreement or agreement using a Likert scale (1-4) by circling the number and then indicating their first preference. The second section was subdivided into two smaller sections, Set A and Set B. Set A consisted of four statements relating to preferred learning style and set B consisted of six statements relating to different learning styles. This was done to help alleviate both tediousness and distractibility. Small but significant differences among the statements could be noted by the participant as well. Following these two sets of learning style types, two separate statements directed the participant to indicate a preference for each of the sets and then indicate their top preference. The third major section consisted of two subsections of statements in which the participant indicated with one check in each subsection the constancy and type of noise they could hear both from outside the home and inside the home.

General Procedures:

The following general procedures were utilized in this investigation:

1. Permission was requested by the investigators and granted by the Internal Review Board from the southeastern university for the investigation.

2. Questionnaires were given to all of the graduate special education classes to achieve the highest number in the sample assuming the participants to be representative of similar classes (population) throughout the year.

3. Permission forms were signed and the questionnaires were filled out. Permission forms were separated from the questionnaires to maintain confidentiality.

4. The data were entered into the SPSS program and analyzed.

Results

Relationship between Environmental Noise-Type and Constancy from an Inside location and Preferred Learning Style

Inside Location (Set A)

The findings indicated no differences between inside location, noise constancy and type, and preferred teaching-learning style. ANOVA findings indicated significance factors ranging from $p \leq .68$ ($F = .386$, $df = 2,34$), for use of few words, use board and/or overhead for outline, and listen only, $p \leq .17$. ($F=1.82$, df. = 2,33) for only lecture, no overhead or board use and take notes. Participants being able to constantly, occasionally or rarely hear traffic least preferred only lecture, no overhead or board use and take notes. They most preferred lecture, use of outline on board or overhead and take notes (See Table 2).

Inside Location (Set B)

The findings indicated no significant differences for participants teaching-learning styles in relationship to inside noise and noise constancy and type (constant, occasional, and rare traffic noise to just neighbor noises and nature sounds). ANOVA non-significant statistical differences ranged from $p \leq .20$ ($F=1.65$, $df = 2,33$) to $p \leq .85$ ($F = .166$, $df = 2,34$),. Participants least preferred the use of few words, write or have key elements on board or overhead, and listen only ($M=1.72$, $SD = .88$) to the most preferred learning style of having the professor lecture, have activities, and write or have key elements on board or overhead, and take notes respectively (See Table 3).

Relationship between Environmental Noise-Type and Constancy from an Outside Location and Preferred Learning Style

Outside Location (Set A)

The findings indicated no differences between outside location, noise constancy and type, and preferred teaching-learning style. ANOVA findings indicated significance factors ranging from $p \leq .97$ ($F = .039$, $df = 2,34$) for only lecture, no overhead or board use, and take notes to $p \leq .29$ ($F=1.125$, $df=2,35$) for use of few words, use board and/or overhead for outline and listen only. Participants being able to constantly, occasionally or rarely hearing traffic outside least preferred only lecture, no overhead or board use and take notes ($M =1.59$, $SD = .90$). They most preferred lecture, use of outline on board or overhead and take notes ($M = 3.28$, $SD = .60$) (See Table 4).

Outside location (Set B)

The findings indicated no significant differences for participants learning styles in relationship to outside noise and noise constancy and type (constant, occasional, and rare traffic noise to just neighbor noises and nature sounds). ANOVA non-significant statistical differences ranged from $p \leq .88$ ($F = .135$, $df = 2, 35$), to $p \leq 18$ ($F = 1.832$, $df = 2, 34$). Participants least preferred the use of few words, write or have key elements on board or overhead and listen only ($M=1.76$, $SD = .89$,) to the most preferred teaching-learning style of having the professor lecture, have activities, and write or have key elements on board or overhead, and take notes ($M = 3.34$, $SD = .78$)(Table 5).

Participants Preferred Learning Styles By Gender

Set A

The two highest ranked preferred learning styles in Set A generally for all participants in order of preference were: lecture and write key elements on board or on overhead and take notes (n= 22, 52%); lecture and use outline on board or overhead and take notes (n= 18, 42%).

Frequency findings of the investigation indicated that females preferred lecture and write key elements on board or on overhead, and take notes (female, n=20; male, n= 1) and males preferred lecture, use outline on board or overhead, and take notes (female, n= 15; male, n=3)(Table 6). No significant differences could be validly computed due to the large difference in number of females versus males.

Set B

The three highest ranked preferred learning styles in Set B generally for all participants in order of preference were: lecture, have activities, and write or have key elements on board or overhead, and take notes (n=23, 54%); lecture and have activities, use outline on overhead or board and take notes (N=11, 26%); and lecture, have activities and take notes (n=5, 12%).

The findings of this investigation indicated that females preferred lecture, have activities, and write or have key elements on the board or overhead, and take notes (female, n= 21; males, n=1) while males preferred lecture, have activities, use outline on overhead or board, and take notes (females, n= 8; males; n= 3)(Table 7). No significant differences could be validly computed due to the large number of difference in number between females and males.

Sets A and B

The two highest ranked preferred learning styles of both Sets A and B generally for all participants were: lecture, have activities, and write or have key elements on board or overhead, and take notes (n=19,) and lecture, have

activities, use outline on overhead or board, and take notes (n=8). The findings of this investigation also indicate that females preferred to have lecture, have activities, and write or have key elements on board or overhead and take notes (females, n = 17; males, n= 1) while males preferred to have lecture, have activities, use outline and take notes (females = 6, males = 2)(Table 8). No significant differences could be validly computed due to the large differences in number between males and females.

Participants Preferred Learning Styles By Age

Set A

The findings of this investigation indicated that the most preferred learning style for Set A was lecture and write key elements on the board or on overhead and take notes for all age ranges (17-27, n=5; 28-33, n=5; 34-45, n=6; 46-63, n= 5). The second most preferred learning style was to have a lecture, use outline on board or overhead and take notes (17-27, n=4; 28-33, n=4; 34-45, n=4; 46 - 63, n=6)(Table 9). Pearson Chi Square procedures indicated no significant differences among age groups' preferred learning styles (X^2 = 2.121, df = 6, $p \leq$ .91)

Set B

The findings of the investigation indicated that the most preferred learning style for Set B was to have lecture, have activities, and write or have key elements on the board or overhead and take notes by age ranges (17-27, n= 6; 28-33, n= 7; 34-35, n= 5; 46-63, n= 5)(Table 10). Pearson Chi-Square procedures indicated no significant differences (X^2 = 15.19, df = 15, $p \leq$ .44)

Sets A and B

The findings of the investigation indicated that the most preferred learning style was to listen to lecture, have activities and write or have key elements on the board and take notes by age ranges (17-27 n= 5, 28-33, n= 6, 34-45, n= 4, 46 -63, n= 4)(Table 11). Pearson Chi Square procedures did not indicate significant differences between age groups and preferred learning styles (X^2 = 15.125, df = 15, $p \leq$ .44)

Discussion

Relationship between Environmental Noise-(Type and Constancy) from an Inside or Outside Location and Preferred Learning Style

The findings of this pilot study indicated that while there were no significant differences between inside or outside location, preferred learning style or noise (constancy and type), both inside and outside groups preferred lecture, outline, activities and take notes (visual-kinesthetic) over the least preferred learning style of lecture, no overhead or few words, write key elements and listen only (auditory).

One reason for this finding is that teachers living with noise may have become accustomed to it. Initial coping with the noise may have reinforced this behavior over the years. Those rarely hearing noise may have a background of hands-on activities and therefore prefer this learning style to other styles.

Participants Preferred Learning Styles By Gender

No significant differences could be computed for learning style preference differences due to the unequal number of males versus females. Therefore, the data on males should be viewed with caution due to the small number of males used in this study. The findings of this investigation indicate that females prefer to have lecture with the key elements written on the board or overhead and take notes. Conversely, males preferred having an outline rather than key words, activities, and take notes. This finding suggests that another factor may be affecting learning style preferences where females prefer wider ranges of possibilities and associations for creative purposes or may be simultaneous, cognitive style thinkers. Males may have a more linear cognitive style. Both females and males preferred to have activities suggesting that focus and concentration may be problematic for both genders if the activities would be removed.

Participants Preferred Learning Styles By Age

The findings of this study relating age and preferred learning style indicated no significant differences among age ranges and preferred learning styles. There was a definite preference of having lectures, activities, key elements and take notes to nothing visual and concurrently take notes or listen only (only auditory). These findings suggest that differences in learning style may not be an effect of chronological or developmental growth but result from an inherent or genetic factor causing a preference in learning style for teachers. The findings also suggest that teachers may have chosen this field because of their own preferences in learning style since using teaching activities in the classroom requires their preferred learning style.

Summary

For graduate students who are teachers, noise (constancy and type) from either an inside or outside location was not a significant factor in relation to preferred learning style. With regard to gender and age, participants preferred to have key elements or outline, activities, and take notes in contrast to an auditory learning style. The findings suggest that professors at higher institutions should teach using the visual and kinesthetic modalities by having either key elements or outline on the board or overhead, providing activities, and graduate students taking notes.

Limitations of the Study

The study had the following limitations:

1. The sample may not have been as representative of the population as assumed.

2. A number of participants did not complete all of the questions within each of the sections possibly influencing the statistical data. Participants have a right not to have to fill in all of the required information.

3. The study is limited to the population of the university classes. This is frequently done for pilot studies.

4. The study is limited to the graduate teachers and students having a minimum of a Bachelors degree.

Recommendations for Future Research

This was a pilot study. The results indicate that other factors may be considered for future investigations.

1. Utilize a multistage or cluster sampling procedures to attain participants from distinctive geographic areas.

2. Utilize a sample that includes participants from different universities and various states.

3. Utilize a more heterogeneous sample having:
   a) non-teaching degree majors and/or
   b) culturally diverse populations

4. Modify questionnaire to make smaller age and noise constancy and type ranges.

5. Conduct five and ten year longitudinal studies to determine age, noise (constancy and type), and preferred learning style changes.

Table 1

Participants' General and Academic Characteristics (N=43)

Variable	Condition	N *
Gender*	Male	06
	Female	36
Age (range recoded)*	17-27	09
	28-33	10
	34-45	11
	45-63	12
Familial Descent*	African American-Born U.S.	07
	Spanish American-Born Car.Islands, South-Or Central America	01
	Native American born	01
	European or Australian American White-born U.S.	33
Living Area	Major City	
	Inner city	06
	Suburb	10
	Medium City	
	Inner	20
	Rural Area	07
Education Status	Bachelors (B.A./B.S./B. Ed.)	37
	Masters (M.A./M.S./M. Ed.)	06

*Missing: N=1

Table 1 (Continued)

Participants' General and Academic Characteristics (N=43)

Variable	Condition	N *
Certification area (Add-On)	Special Education-High School	
	-severe	05
	-mild/mod.	09
	-mm/gifted	01
	Special Education Secondary	03
	Special Education Middle	
	-Mild/Mod	02
	Special Education-Elementary	
	(Not incl. grades 7-8)	05
	Special Education Grades 1-8	04
	General-High School	
	-Soc. Studies	01
	Mathematics	03
Major Degree Area	El. Only	01
	El. & Spec.Ed.	01
	Spec. only at El.(to grade 6)	01
	Spec. Ed. at El. Grades 1-8)	04
	Spec. Ed. only at Middle	01
	Spec. Ed. only at Middle and	
	High School	01
	Middle and/or High School	
	With Spec. Ed.	06
	Spec. Ed. only at High School	03
	Special Education Grades K-12	01
	Other	01

*Missing: N=1

Table 2

Participants' Perceptions of Learning Style and Inside Noise (Constancy and Type), Means, Standard Deviations and ANOVA Findings.
Set A

Learning Style	Traffic[1]	N	Mean	S.D.	S.E.	F ratio	Sig. ($P<.05$)
In any university course I prefer the professor to:							
-**only lecture**, no overhead	Con.	06	1.33	.52	.21		
or board use, and	Occ.	18	1.78	.94	.22		
I take notes.	Non	12	1.25	.62	.18	1.82	.18
-**lecture** and write **key**	Con	06	3.50	.55	.22		
elements on board or	Occ.	18	3.17	.92	.22		
on overhead, and	Non	12	2.83	1.11	.32	1.05	.36
I take notes.							
-**lecture**, use **outline** on	Con.	06	3.50	.55	.22		
board or overhead, and	Occ.	19	3.21	.63	.14		
I take notes.	Non	13	3.31	.63	.17	.51	.61
-use **few words, use**	Con.	07	2.14	1.21	.45		
board and/or overhead	Occ.	18	1.83	.78	.18		
for **outline,** and	Non	12	1.75	1.06	.30	.39	.68
I listen only.							

[1] **Traffic Constancy and Type** **Con.** =Constantly hearing traffic
Occ. =Occasionally hearing traffic
Non =No hearing of traffic

Table 3

Participants' Perceptions of Learning Style and Inside Noise (Constancy and Type), Means, Standard Deviations and ANOVA Findings
Set B

Learning Style	Traffic[1]	N	Mean	S.D.	S.E.	F ratio	Sig. $P < .05$
In any university course I prefer the professor to:							
-use **few words, write or have key elements** on board or overhead, and I listen only.	Con.	06	2.167	1.33	.54		
	Occ.	18	1.67	.77	.18		
	Non	12	1.59	.79	.23	.94	.40
-**lecture**, have **activities,** and I take notes.	Con.	06	2.67	1.37	.56		
	Occ.	18	3.17	.51	.12		
	Non	12	2.67	.89	.26	1.65	.21
-**lecture, have activities**, and **write or have key elements on board** or overhead, and I take notes.	Con.	06	3.33	1.21	.49		
	Occ.	19	3.42	.61	.14		
	Non	12	3.25	.87	.25	.17	.85
-**lecture, have activities, use outline** on overhead or board, and I take notes.	Con.	06	2.83	.98	.40		
	Occ.	19	3.36	.60	.14		
	Non	13	3.00	.92	.25	1.48	.24
-use **few words, have activities, use board and/ overhead** for **outline,** and I listen only.	Con.	06	2.00	1.10	.45		
	Occ.	18	2.11	.96	,23		
	Non	12	1.83	.83	.24	.31	.74
-use **few words**, have **activities,** write or have **key elements on board or overhead,** and I listen only.	Con.	06	1.83	1.33	.54		
	Occ.	18	1.94	1.00	.23		
	Non	12	1.67	.78	.22	.28	.76

[1] **Traffic Constancy and Type** **Con.** =Constantly hearing traffic
Occ. =Occasionally hearing traffic
Non =No hearing of traffic

Table 4
Participants' Perceptions of Learning Style and Outside Noise (Constancy and Type), Means, Standard Deviations, and ANOVA Findings
Set A.

Learning Style	Traffic[1]	N	Mean	S.D.	S.E.	F ratio	Sig. ($P<.05$)
In any university course I prefer the professor to:							
-**only lecture**, no overhead **or board use, and** I take notes.	Con.	09	1.67	.89	.33		
	Occ.	23	1.57	.90	.19		
	Rare	05	1.60	.89	.40	.039	.96
-**lecture** and write **key elements on board** or on overhead, and I take notes.	Con	09	3.33	.71	.24		
	Occ.	23	3.09	.95	.20		
	Rare	05	2.80	1.30	.54	.52	.60
-**lecture**, use **outline** on board or overhead, and I take notes.	Con.	10	3.40	.52	.16		
	Occ.	23	3.17	.65	.14		
	Rare	06	3.50	.55	.22	.94	.40
-use **few words, use board** and/or overhead for **outline,** and I listen only.	Con.	10	2.30	1.06	.34		
	Occ.	23	1.74	.92	.19		
	Rare	05	1.80	.84	.37	1.25	.30

[1] **Traffic Constancy and type : Con. =Constantly hearing traffic**
Occ. =Occasionally hearing traffic
Rare =Rarely hearing traffic- only nature/neighbor sounds

Table 5
Participants' Perceptions of Learning Style and Outside Noise (Constancy and Type), Means, Standard Deviations and ANOVA Findings
Set B.

Learning Style	Traffic[1]	N	Mean	S.D.	S.E.	F ratio	Sig. (P<.05)
In any university course I prefer the professor to:							
-use **few words, write or have key elements** on board or overhead, and I listen only.	Con.	09	2.22	1.21	.40		
	Occ.	23	1.56	.73	.15		
	Rare	05	1.80	.84	.37	1.83	.18
-**lecture**, have **activities,** and I take notes.	Con.	09	3.00	1.22	.41		
	Occ.	23	3.04	.64	.13		
	Rare	05	2.40	.89	.40	1.22	.30
-**lecture, have activities**, and **write or have key elements on board** or overhead, and I take notes.	Con.	09	3.44	1.01	.14		
	Occ.	24	3.29	.69	.14		
	Rare	05	3.40	.89	.40	.14	.88
-**lecture, have activities, use outline** on overhead or board, and I take notes.	Con.	10	3.0	.82	.26		
	Occ.	23	3.2	.67	.14		
	Rare	06	3.17	1.17	.48	.26	.77
-use **few words, have activities, use board and/ overhead** for **outline,** and I listen only.	Con.	09	2.44	1.24	.41		
	Occ.	23	1.91	.79	.16		
	Rare	05	1.80	.84	.37	1.25	.30
-use **few words**, have **activities,** write or have **key elements on board or overhead,** and I listen only.	Con.	09	2.22	1.30	.43		
	Occ.	23	1.74	.86	.18		
	Rare	05	1.80	.84	.37	.80	.46

[1] **Traffic Constancy and type : Con.** =Constantly hearing traffic
Occ. =Occasionally hearing traffic
Rare =Rarely hearing traffic- only nature/neighbor sounds

Table 6

Participants' Most Preferred Learning Styles By Gender Set A

Learning Style	Gender	N	%
In any university course I prefer the professor to:			
-**only lecture**, no overhead **or board use, and** I take notes.		**00**	**00 %**
	Female	00	
	Male	00	
-**lecture** and write **key elements on board** or on overhead, and I take notes.		**22**	**51 %**
	Female	20	
	Male	01	
-**lecture**, use **outline** on board or overhead, and I take notes.		**18**	**42 %**
	Female	15	
	Male	03	
-use **few words, use board** and/or overhead for **outline**, and I listen only.		**02**	**05 %**
	Female	00	
	Male	02	
Total N Missing		**01**	**02 %**
Total N Responding		**42**	**98 %**
Total N		**43**	**100 %**

Table 7

Participants' Most Preferred Learning Styles By Gender Set B

Learning Style	Gender	N	%
In any university course I prefer the professor to:			
-use **few words, write or have key elements** on board or overhead, and I listen only.		**01**	**02 %**
	Female	01	
	Male	00	
-**lecture**, have **activities,** and I take notes.		**05**	**12 %**
	Female	04	
	Male	01	
-**lecture, have activities**, and **write or have key elements on board** or overhead, and I take notes.		**23**	**54 %**
	Female	21	
	Male	01	
-**lecture, have activities, use outline** on overhead or board, and I take notes.		**11**	**26 %**
	Female	08	
	Male	03	
-use **few words, have activities, use board and/ overhead** for **outline,** and I listen only.		**01**	**02 %**
	Female	01	
	Male	00	

Table 7 (Continued)

Participants' Most Preferred Learning Styles
By Gender
Set B

Learning Style	Gender	N	%
In any university course I prefer the professor to:			
-use **few words**, have **activities,** write or have **key elements on board or overhead,** and I listen only.		**01**	**02 %**
	Female	00	
	Male	01	
Total N Missing		**01**	**02 %**
Total N Responding		**42**	**98 %**
Total N		**43**	**100 %**

Table 8

Participants' Most Preferred Learning Styles By Gender Between Sets A and B

Learning Style	Gender	N	%
In any university course I prefer the professor to:			
-**only lecture**, no overhead **or board use, and** I take notes.		**00**	**00 %**
	Female	00	
	Male	00	
-**lecture** and write **key elements on board** or on overhead, and I take notes.		**03**	**07 %**
	Female	03	
	Male	00	
-**lecture**, use **outline** on board or overhead, and I take notes.		**04**	**09 %**
	Female	04	
	Male	00	
-use **few words, use board** and/or overhead for **outline**, and I listen only.		**00**	**00 %**
	Female	00	
	Male	00	
-use **few words, write or have key elements** on board or overhead, and I listen only.		**00**	**00 %**
	Female	00	
	Male	00	

Table 8 (Continued)

Participants' Most Preferred Learning Styles By Gender Between Sets A and B

Learning Style	Gender	N	%
In any university course I prefer the professor to:			
-**lecture**, have **activities,** and I take notes.		**02**	**05 %**
	Female	01	
	Male	01	
-**lecture, have activities**, and **write or have key elements on board** or overhead, and I take notes.		**19**	**44 %**
	Female	17	
	Male	01	
	Missing	01	
-**lecture, have activities, use outline** on overhead or board, and I take notes.		**08**	**19 %**
	Female	06	
	Male	02	
-use **few words, have activities, use board and/ overhead** for **outline,** and I listen only.		**00**	**00 %**
	Female	00	
	Male	00	
-use **few words**, have **activities,** write or have **key elements on board or overhead,** and I listen only.		**01**	**02 %**
	Female	00	
	Male	01	

Table 9

Participants' Most Preferred Learning Styles by Age Set A

Learning Style	Age Range	N/Total N Per Range	%
In any university course I prefer the professor to:			
-**only lecture**, no overhead	17-27	00/09	00
or board use, and	28-33	00/09	00
I take notes.	34-45	00/11	00
	46-63	00/12	00
Total		**00/41**	**00**
-**lecture** and write **key**	17-27	05/09	56
elements on board or	28-33	05/09	56
on overhead, and	34-45	06/11	55
I take notes.	46-63	05/12	42
Total		**21/41**	**51**
-**lecture**, use **outline** on	17-27	04/09	44
board or overhead, and	28-33	04/09	44
I take notes.	34-45	04/11	36
	46-63	06/12	50
Total		**18/41**	**44**
-use **few words, use**	17-27	00/09	00
board and/or overhead	28-33	00/09	00
for **outline**, and	34-45	01/11	09
I listen only.	46-63	01/12	08
Total		**02/41**	**05**

Table 10

Participants' Most Preferred Learning Styles By Age Set B

Learning Style	Age Range	N/Total N Per range	%
In any university course I prefer the professor to:			
-use **few words, write or have key elements** on board or overhead, and I listen only.	17-27	01/09	11
	28-33	00/09	00
	34-45	00/11	00
	46-63	00/12	00
	Total	**01/41**	**02**
-**lecture**, have **activities,** 00 and I take notes.	17-27	00/09	00
	28-33	00/09	00
	34-45	02/11	18
	46-63	02/12	17
	Total	**04/41**	**10**
-**lecture, have activities,** and **write or have key elements on board** or overhead, and I take notes.	17-27	06/09	67
	28-33	07/09	78
	34-45	05/11	45
	46-63	05/12	42
	Total	**23/41**	**56**
-**lecture, have activities, use outline** on overhead or board, and I take notes.	17-27	02/09	22
	28-33	02/09	23
	34-45	02/11	18
	46-63	05/12	42
	Total	**11/41**	**27**
-use **few words, have activities, use board and overhead** for **outline,** and I listen only.	17-27	00/09	00
	28-33	00/09	00
	34-45	01/11	09
	46-63	00/12	00
	Total	**01/41**	**02**

Table 10 (Continued)

Participants' Most Preferred Learning Styles
By Age
Set B

Learning Style		Age Range	N/Total N Per Range	%
In any university course I prefer the professor to:				
-use **few words**, have		17-27	00/09	00
activities, write or have		28-33	00/09	00
key elements on		34-45	01/11	09
board or overhead, and I		46-63	00/12	00
listen only.	**Total**		**01/41**	**02**

Total N Missing	**02**	**02 %**
Total N Responding	**41**	**98 %**
Total N	**43**	**100 %**

Table 11

Participants' Most Preferred Learning Styles by Age Between Sets A and B

Learning Style	Age Range	N/Total N Per Range	%
The following are responses for learning styles responded to.			
In any university course I prefer the professor to:			
-**lecture** and write **key elements on board** or on overhead, and I take notes.	17-27	01/09	11
	28-33	00/08	00
	34-45	00/08	00
	46-63	01/11	09
	Total	**02/36**	**06**
-**lecture**, use **outline** on board or overhead, and I take notes.	17-27	02/09	22
	28-33	01/08	13
	34-45	00/08	00
	46-63	01/11	09
	Total	**04/36**	**11**
-**lecture, have activities**, and I take notes	17-27	00/09	00
	28-33	00/08	00
	34-45	00/08	00
	46-63	02/11	18
	Total	**02/36**	**05**
-**lecture, have activities**, and **write or have key elements on board** or overhead, and I take notes	17-27	05/09	55
	28-33	06/08	75
	34-45	04/08	50
	46-63	04/11	36
	Total	**19/36**	**53**
-**lecture, have activities**, **use outline** on overhead or board, and I take notes	17-27	01/09	11
	28-33	01/08	13
	34-45	02/08	25
	46-63	04/11	36
	Total	**08/36**	**22**

Table 11

Participants' Most Preferred Learning Styles by Age Between Sets A and B

Learning Style	Age Range	N/Total N Per Range	%
In any university course I prefer the professor to:			
-use **few words**, have	17-27	00/09	00
activities, write or have	28-33	00/08	00
key elements on board or	34-45	01/08	13
overhead, and I listen only	46-63	00/11	00
	Total	**01/36**	**03**

Total N Missing	**07**	**16 %**
Total N Responding	**36**	**84 %**
Total N	**43**	**100 %**

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